IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF UTAH, CENTRAL DIVISION

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WAVETRONIX, LLC, Plaintiff, vs. EIS ELECTRONIC INTEGRATED SYSTEMS, INC., Defendant.	)	Civil No. 2:05-CV-0073 BSJ **MEMORANDUM OPINION & ORDER**

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Plaintiff Wavetronix, LLC, the owner by assignment of U.S. Patent No. 6,556,916 (the "'916 patent"), filed this action against Defendant EIS Electronic Integrated Systems, Inc. claiming that Defendant's RTMS X3 product infringes the '916 patent.[1] Defendant filed a counterclaim against Plaintiff, seeking a declaration from the court that the '916 patent is not infringed by the RTMS X3, is invalid, and is unenforceable due to inequitable conduct.[2]

The court has conducted extensive pretrial conferences in this case.[3] During the pretrial

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[1](Second Amended Complaint for Patent Infringement (dkt. no. 391) ("Plaintiff's Second Amend. Compl.").)

[2](EIS' Answer and Counterclaims to Second Amended Complaint (dkt. no. 393).) The question of whether the '916 patent is unenforceable by reason of inequitable conduct has previously been resolved by way of summary judgment. After the parties' cross-motions for summary judgment on the issue of inequitable conduct was fully briefed and argued, the court granted Plaintiff's motion (Plaintiff's Cross-Motion for Summary Judgment to Dismiss Defendant's Defense of Inequitable Conduct (dkt. no. 265)) and denied Defendant's motion (EIS's Motion for Summary Judgment of Unenforceability (dkt. no. 147)). (See Order Granting Wavetronix' Motion for Summary Judgment Dismissing EIS' Defense of Inequitable Conduct, dated May 18, 2006 (dkt. no. 390).)

[3](See Minute Entry, dated January 19, 2006 (dkt. no. 316); Minute Entry, dated January 20, 2006 (dkt. no. 317); Minute Entry, dated January 31, 2006 (dkt. no. 330); Minute Entry, dated March 8, 2006 (dkt. no. 361); Minute Entry, dated April 4, 2006 (dkt. no. 379); Minute Entry, dated April 5, 2006 (dkt. no. 380); Minute Entry, dated May 24, 2006 (dkt. no. 412); Minute Entry, dated May 25, 2006 (dkt. no. 413); Minute Entry, dated May 26, 2006 (dkt. no. 414); Minute Entry, dated June 29, 2006 (dkt. no. 416); Minute Entry, dated June 30, 2006 (dkt. no.

(continued...)

hearings, L. David Griffin, Janna L. Jensen, Brett I. Johnson, Brent P. Lorimer, Chad E. Nydegger, and Thomas R. Vuksinick of Workman Nydegger have appeared at various times on behalf of Plaintiff, and Bryon J. Benevento of Snell & Willmer, and Steven C. Cherny and Maximilian A. Grant of Latham & Watkins have appeared at various times on behalf of Defendant.[4]

During several days of the pretrial process, the court considered the parties' proffer of testimony from their expert witnesses.[5] The court also heard and considered extensive argument regarding the parties' respective positions.

The court has carefully considered the parties' briefs in this matter, as well as the parties' arguments and proffers during the pretrial hearings. Now being fully advised, the court renders the following Memorandum Opinion and Order.

If we penetrate the wall of words found in the patent claims, this case is about a method for using radar to gather and accumulate data for use in traffic planning and traffic control, the quality of which depends upon the accurate positioning of a radar sensor. The patent at issue is limited to the "system," "sensor," " method"[6] used in installing a sensor and related equipment, on-site, ready for future use in monitoring traffic in lanes as "dynamically defined" during sensor

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[3](...continued)
417); Minute Entry, dated February 14, 2007 (dkt. no. 436); Minute Entry, dated August 9, 2007 (dkt. no. 462); Minute Entry, dated August 10, 2007 (dkt. no. 463).)

[4](*Id.*)

[5](Minute Entry, dated May 24, 2006 (dkt. no. 412); Minute Entry, dated May 25, 2006 (dkt. no. 413); Minute Entry, dated May 26, 2006 (dkt. no. 414); Minute Entry, dated June 29, 2006 (dkt. no. 416); Minute Entry, dated June 30, 2006 (dkt. no. 417).)

[6]The operative words are found in the first sentence of claim 1 of the '916 patent. ('916 patent (Ex. 1 to Plaintiff's Second Amend. Compl. (dkt. no. 391)).)

installation.

While the patent claims express the usual expansive enthusiasms of patent counsel, and are fashionably broad in scope, Plaintiff's "preferred embodiment" of its process consists of a series of steps, claimed novel, set forth in claim 1 as follows:

> What is claimed is:
> 1. In a traffic monitoring system having a sensor, a method for defining traffic lanes, comprising the steps of:
> a. for a selectable plurality of vehicles,
> i. detecting each of said selectable plurality of vehicles present within a field of view of said sensor;
> ii. estimating a position of said each of said selectable plurality of vehicles;
> iii. recording said position of said each of said selectable plurality of vehicles;
> b. generating a probability density function estimation from each of said position of said each of said selectable plurality of vehicles; and
> c. defining said traffic lanes within said traffic monitoring system from said probability density function estimation.[7]

Thus, Plaintiff's "preferred embodiment" of its installation process involves a radar sensor and during the installation of the sensor, using information received by the sensor and then accumulating the same as to the location of vehicles passing on a roadway (or a part thereof) over a period of time, and thereafter processing such information by computer using a sophisticated but un-patented program to produce histograms of the traffic locations and thus to "define" traffic lanes for system purposes by using actual data of where the vehicles (selected plurality) are or have been detected during the installation process. Such is done to make sure the sensor is positioned correctly and is ready for future use in gathering information from future passing vehicles at the same location that are within the "lanes" as previously "defined" and

[7]('916 patent (emphasis added).)

within the sensor's field of view.

Defendant's accused method involves using radar to gather information from passing vehicles and using a lesser quantum of information (10 cars or more) and a much less sophisticated form of computer processing, but one that is "good enough" to correctly correlate its sensor with "traffic lanes" on a given roadway, ready for future use. Defendant does not "define lanes dynamically." It counts and locates vehicles at a given location. Like Plaintiff, Defendant wants to make sure its sensor is correlated with the existing road and its passing vehicles so that vehicles passing through its field of view are picked up by its sensor in the future.

Neither of the parties claim a patent on radar.

> **[R]a´dar**, (rā´där), *n.* [*Radio Detecting and Ranging.*] A radio detecting device that emits and focuses a powerful scanning beam of ultra-high-frequency waves and establishes through reception and timing of reflected waves the distance, altitude, and direction of motion of any object in the path of the beam, unhindered by darkness, storm, cloud or fog.[8]

Background information found in a current text on science explains as follows:

> Different wavelengths of light are adept at different feats. Radio waves, being very long, can travel without being absorbed or scattered by air molecules, and the longest ones bend readily around the curve of the Earth. They are therefore excellent at transmitting broadcast signals from far-flung radio and television stations to the appropriate receiving device in your home or automobile or, as some people swear, the fillings in one's teeth.
>
> Next down on the electromagnetic spectrum is the ill-named light brigade, microwave radiation. Microwaves are not micro at all, but reasonably wide-bodied, extending from about a

[8] *Websters New International Dictionary of the English Language* at cxxv [Addenda] (2d ed. 1955).

> centimeter up to a meter in length. Like radio waves, they're long enough to convey signals through the air unfazed. Unlike radio waves, they can be focused into a highly directional beam and hence transmit the signals from one horned antenna to another with a relative degree of security and privacy. Radar is a form of microwave radiation, a directional pulsing of microwaves that reflect off solid objects and back to a receiver, revealing the location of pinged objects with extraordinary precision. A top-of-the-line radar can pinpoint the whereabouts of a housefly two kilometers away, although clearly this is a radar with far too much time on its hands.[9]

Radar has been around for more than half a century and has been used to monitor the existence, location, and movement of objects ranging from ships to aircraft to missiles and detection is often symbolized by "blips" on a radar screen.

> "Blip" comes from "pip." On a radar scope the "blip" is indication of the return of radar waves reflected from an object. It may be in the form of an inverted V or a spot of "light."[10]

Radar guns are used by highway patrol officers to detect the speed of vehicles using the highways, and display a numerical result.

In this action the plaintiff makes no claim for radar nor for its transceiver (sensor) which it uses to receive reflections from passing traffic. Neither claims a patent on its respective proprietary and unrevealed computer program through which it processes its accumulated information.

It is the five-step method of system installation to which Plaintiff lays claim. It asserts that Defendant uses the same method, and thus infringes.

Plaintiff's patent claims "system," "sensor," and "method" consist of a transmitter of high

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[9]Natalie Angier, *The Canon* 111, 112 (2007) (emphasis added).

[10]*Websters*, [Addenda] cxxiii.

frequency electromagnetic waves as well as a receiver to detect the reflection back of such waves reflected from the surface of a vehicle occupying a defined space – a lane or path – on a road or highway. The device is called a "transceiver" (transmitter – receiver) or by the more general term "sensor." Such a sensor is available "off the shelf" from other vendors. Plaintiff claims to have custom-made its own sensor for which, in this case, no claim is made.

The purpose of the sensor is to gather data within its "field of view," i.e., vehicle numbers, intensity, frequency, direction, and location on a roadway – all to be used in traffic planning, management, and control once installed. Once installed, such is claimed to replace an air hose across a highway, a person with a hand counter, an embedded coil in the road, a sound detector, or a camera, all of which gather similar data, but in different ways. The system accumulates information in real time.

Plaintiff's sensor sits on a pole adjacent to a road, highway, freeway or intersection used by vehicles, and is pointed so that waves of varying power generated by it can bounce back from vehicles at differing locations, lanes or paths identified during installation. It gathers vehicle data, and in step 1(b) of its claim, uses a computer program to discard some data, (noise, or below threshold information), and processes the remaining data in a fairly complex and sophisticated way to produce for the benefit of the device installer a “probability density function,” which Plaintiff equates with one or more histograms of the location and the frequency of vehicle detection, and which, for the purpose of the installer defines traffic lanes “dynamically,” and which, in turn supplies the installer with “blips” on his laptop representing vehicles which he views and compares with what he sees on the ground. If satisfied that the sensor’s field of view seems to correlate with actual road use or lane use, he “fixes” the “defined

lanes" in the system by pushing an operations button on its device. The installation is then complete. Hopefully the "dynamically defined lanes" correlate with the marked lanes on the road if such there be, but need not do so. The dynamically defined lanes have been "defined" by where vehicles appeared during installation, and from a generated histogram of such data, purporting to predict or infer where vehicles will be detected in the future on the same road. That enables the sensor to gather data from vehicles which pass through the same location in the future. That is one of the claimed virtues of defining lanes for system use from actual data of vehicle frequency and location gathered during installation.

During its set-up phase, the five-step procedure purports to define traffic lanes "dynamically" by actually counting the frequency of vehicles in a given location over a brief period of time, usually a minute; and as indicated above processes such data by computer through the use of a specialized secret but non-patented computer program, and thereafter displays the result on a computer monitor in the form of blips. The computer has previously generated internally one or more histograms on a grid (called range bins) showing peaks (lane centers) and valleys (boundaries of lanes) which, according to Plaintiff, "dynamically" define the traffic lanes by actual use and in turn creates blips on the laptop screen to enable the installer to see where vehicles have been and are now passing by, and infer where vehicles will be passing by in the future. The purpose of the histogram-produced blips, it seems to the court, is to make sure the sensor's field of view is where the installer wants it to be, much like focusing a camera on a particular target, focusing one's eye, or the lens of a telescope.

An advantage touted by the inventor of the method is that there is less need for installation personnel to climb poles frequently or otherwise to manually adjust the sensor to

correlate its field of view with the terrain where vehicles are expected to be in the future. This is said to save money by reducing the personnel time for installation of the device and subsequent adjustments.

When the device is properly installed in accordance with the claimed five-step method, such procedure is concluded, and the new well-adjusted life of the system, as installed, begins its traffic-detecting days allegedly protected by a sister patent.

Plaintiff's system then in place may thereafter be adjusted electronically from a remote location, rather than manually. The adjustment however is internal. The sensor does not move. Its position, height, and angle are fixed. The Defendant's system requires on-site physical adjustment or on-site electronic adjustment.

Remote adjustment of Plaintiff's sensor is not done at the time of the initial installation, and indeed, may never be done. Remote adjustment seems to have no role in the initial installation, but is a capability built into Plaintiff's system much touted in the marketplace as being available post-installation. Defendant's system has no capability of adjustment from afar and requires on-site adjustment.

For reasons best known to Plaintiff, other patents and other claims cover the actual equipment, including its sensor, beyond the initial installation when it actually functions day in and day out to detect the location and frequency of vehicles using a road, highway or lanes thereof, and does so in real time in purported affirmation of the prior prediction (the probability density function) that future vehicles would occupy the "defined lanes" as determined during the period of device installation.

Plaintiff's esoteric choice of language, as set forth in its claims, gives one pause to

determine what the patent holder is saying when talking about installation. Claim 1 talks of a system, a sensor and a method for detecting a "selectable plurality of vehicles" estimating their position and recording same. Much controversy surrounds construing "a selectable plurality of vehicles," but in reality it means enough vehicles viewed during installation to "dynamically" define the traffic lanes, i.e., to "teach the sensor where the lanes are." Such information, derived from whatever number that flows through the sensor's field of view (the "selectable plurality" of vehicles), takes about a minute in most instances during installation, and is ultimately symbolized by "blips" on the installer's laptop, much as a ship's radar screen shows blips representing other ships in its rotating field of view.

The purpose of such information-gathering in Plaintiff's system is to generate a "probability density function" which plaintiff equates with a histogram.

In reality, a histogram represents a picture, drawn graphically or electronically, of data observed or detected over a period of time, and is usually a curve representing variables recorded over a period of time, *viz.*, vehicle positions in time and space (range or bin). That is, vehicle frequency and location.

Such a curve may be modeled mathematically. The mathematical function that models a histogram of variables in the Plaintiff's system is the probability density function.

Thus, the histogram and the mathematical model serve as two different ways of depicting traffic data.

The mathematical model tries to mimic the data summarized by the histogram.[11]

The "histogram" is not displayed on the Plaintiff's system. From earlier pretrial

[11]It is fundamental that a mathematical function, much like a mathematical formula, is not the subject of patent. Parker v. Flook, 457 U.S. 584 (1978).

discussions, the court was under the impression that histograms were displayed. A surrogate for the histogram is a series of "blips" on the laptop of the installer designating lanes which lets him verify by looking at the "dynamically defined traffic lanes" with blips in place on his laptop and compare what he sees on his laptop with what he sees on the ground. Basically, a series of vehicles passing location "A," or in range "A," or its subdivision bin "A," detected by the sensor lets the installer infer that future vehicles which come down the same roadway will also be detected at location "A," or in range "A," or in bin "A ."

After initial correlation, or lane definition, if there is a change of road conditions caused by construction, lane closure, or weather, needed adjustments to the Plaintiff's "system," "sensor," "method" can be made remotely to harmonize with such changed conditions. Defendant's device or system requires on-site manual or electronic adjustments to adjust its sensor to correlate with changed conditions. It is incapable of making such adjustments remotely.

There is no question that in installing its sensor the Defendant, like Plaintiff, detects vehicles, notes their position on a road, and records their position and accumulates that information. Ships do that. Aircraft do that. Indeed, the prior art as described in Plaintiff's introductory materials does that.[12] (See #3 under Background of the Invention.) Plaintiff states as follows:

> Yet another traffic sensor type is the radar sensor which transmits a low-power microwave signal from a source mounted off-road in a "side-fire" configuration or perpendicular angle transmitting generally perpendicular to the direction of traffic. In a sidefire configuration, a radar sensor is capable of discriminating between

[12]('916 patent, at col. 3.)

> multiple lanes of traffic. The radar sensor detects traffic based on sensing the reflection of transmitted radar. The received signal is then processed and, much like acoustic sensing, detection and traffic flow information are then assigned to the appropriate user-defined lane being monitored. This technology then forms a picture of the traffic based on the input, and analyzes it based on user-assigned zones. Under ideal conditions, once these zones are manually set, they are monitored as the traffic flow operates within the pre-set zones. Consequently, any change in the traffic pattern outside those predefined zones needs to be manually reset in order to detect and monitor that zone.[13]

Plaintiff claims its "zones" or lanes are "defined" for its system by the flow of traffic itself and the computer processing of such information derived from the accumulation of pings in a range over a brief period of time.

There is no question that vehicles in excess of ten through a particular location is "good enough" to indicate to the installer of Defendant's system that vehicles have been, are now, and will be there in that location in the future, and enables the installer to correlate lane one and subsequently other adjacent lanes as a means of calibrating its sensor to the lay of the land. Finding a lane is different than defining a lane. The installer of the Defendant's system correlates what he sees on the laptop grid, usually columns of various colors, with what he sees on the ground to insure that the field of view of the sensor is pointed in the right direction.

The difference between the two processes is the manner in which the accumulated information (whatever its size) is processed and displayed to the installer so as to correlate its sensor with the terrain.

Plaintiff claims to generate a "probability density function – a histogram" – through the use of its sophisticated computer program, and Defendant, using a different and less

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[13](*Id.*)

sophisticated computer program and a lesser database, does not.

Plaintiff "dynamically defines" lanes. Defendant finds or observes where traffic is on-site.

Each installer wants to make sure that its sensor is properly installed at a height and at an angle which will enable it to monitor traffic, count vehicles and do other useful things within its field of view.

If Defendant needs to change its monitor's "found lanes," such requires an installer to return to the site to do so. Plaintiff does not need to return to the site. It may change its "dynamically defined lanes" from a remote location. Its 8½ pages of introductory material, "Detailed Description of the Preferred Embodiments" (columns 4-9), all speak of the "dynamic defining of lanes." The Abstract, Brief Summary of the Invention (columns 3-4), and Brief Description of Drawings (column 4) all refer to a method for "dynamically defining traffic lanes."

Plaintiff's sophisticated method provides histograms and their surrogate blips on the laptop screen during installation, and thus provides a "top of the line" methodology – a kind of modern-day Cadillac of monitoring systems, once installed. Defendant's "Model T Ford" system, with a lesser database and a lesser computer program, is "good enough" for its purposes.

During installation, does the manner in which Defendant processes information equate with the manner in which Plaintiff processes information? It does not. Like Plaintiff, its computer program is proprietary and not the subject of patent claims. It's threshold of vehicle numbers is 10 or more. That may or may not correspond with Plaintiff's ill-defined "selectable plurality." But, counting radar "pings" within a range is not novel. That is what radar systems

do, as explained by Plaintiff in the introductory material quoted above.

Plaintiff's argument is that counting and processing pings from vehicles enables you to predict that cars in the future will pass at the same location, or be in the same range.

Plaintiff's expectation is based on finely processed data, histograms and blips, that vehicles will indeed pass this way again, and will pass through the sensor's field of view. One ordinarily does not need a histogram, algorithm, or a computer on which to foot such a "prediction" as to traffic location on a known and marked highway lane. Implicit, though unexpressed, the purpose of course is to have a properly focused sensor.

Each party predicts where cars will be in the future. Defendant's "lane location" is based on a lesser quantum of data and a less sophisticated processing of data. Of course, that is what an air hose across the highway assumes, as does a person with a hand-counter, an embedded coil in the road, a sound detector, or a camera. Such an assumption or such an "inference," whether done by person or computer, is simply an assumption or inference. If, as does Plaintiff, one chooses to do it in a complex and highly sophisticated and presumably more accurate way using decision theory and a proprietary and un-patented computer program to achieve a "dynamic definition" suitable to correlate sensor with terrain, that is one's choice. One cannot preclude others from installing sensors, gathering data, drawing inferences from a lesser database and a different computer program, and using such inferences to correlate a radar sensor with vehicle-populated terrain.

The manner in which data is processed by the parties is proprietary and is not patented. The sequence followed in Defendant's system and installation sequence is more like the prior art as described by Plaintiff in its introductory materials above, and thus there is no infringement.

Plaintiff's case of patent infringement should be dismissed.

In the above examination and within the context of this opinion, the court has construed the applicable claims and has applied Plaintiff's claims to Defendant's accused process.

LET JUDGMENT BE ENTERED ACCORDINGLY.

DATED this ____ day of September, 2007.

BY THE COURT:

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Bruce S. Jenkins
United States Senior District Judge

Plaintiff's case of patent infringement should be dismissed.

In the above examination and within the context of this opinion, the court has construed the applicable claims and has applied Plaintiff's claims to Defendant's accused process.

LET JUDGMENT BE ENTERED ACCORDINGLY.

DATED this 21 day of September, 2007.

BY THE COURT:

Bruce S. Jenkins
United States Senior District Judge